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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.      | CONFIRMATION NO. |
|-----------------|-------------|----------------------|--------------------------|------------------|
| 10/777,647      | 02/11/2004  | Hardayal Singh Gill  | HIT1P064/HSJ920030278US1 | 1941             |

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EXAMINER

BLOUIN, MARK S

ART UNIT PAPER NUMBER

2627

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/777,647

Applicant(s)

GILL, HARDAYAL SINGH

Examiner

Mark Blouin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/11/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

### Detailed Action

#### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Frietag et al (USPN 6,785,102).

3. Regarding Claims 1,8,10, and 18-20, Frietag et al shows (Figs. 1-7 and 10) a magnetic storage system, comprising magnetic media, at least one head for reading from and writing to the magnetic media, each head having a sensor, a writer coupled to the sensor, a slider for supporting the head; and a control unit coupled to the head for controlling operation of a dual magnetic tunnel junction head, comprising a free layer (F1,F2,F3) having a thickness of less than about 30A, first (AP1) and second (AP2) antiparallel (AP) pinned layer structures positioned on opposite sides of the free layer, each of the AP pinned layer structures including at least two pinned layers having magnetic moments that are self-pinned (Col2, line 57) antiparallel to each other, the pinned layers being separated by an AP coupling layer (APC, 212), a first barrier layer (S1) positioned between the first AP pinned layer structure and the free layer, a second barrier layer (S2) positioned between the second AP pinned layer structure and the free

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layer, wherein the head has a thickness of less than about 500A, wherein the head does not have an antiferromagnetic layer.

4. Regarding Claims 2 and 11, Frietag et al shows (Fig. 10) a head, wherein the free layer includes a layer of NiFe (F1, (250)).

5. Regarding Claims 3 and 12, Frietag et al shows (Fig. 10) a head, wherein the free layer further includes layers of CoFe (252,254) sandwiching the layer of NiFe.

6. Regarding Claims 4 and 13, Frietag et al shows (Fig. 10) a head, wherein the AP pinned layer structures have about the same magnetic thickness.

7. Regarding Claims 5 and 14, Frietag et al shows (Fig. 10) a head, wherein the free layer has a thickness of less than about 30A.

8. Regarding Claims 6 and 15, Frietag et al shows (Fig. 10) a head, wherein the free layer has a thickness of between about 15 and 25A.

9. Regarding Claims 7 and 16, Frietag et al shows (Fig. 10) a head, wherein a half voltage of the head is more than two times greater than a half voltage of a head having a substantially similar structure but having only one barrier layer (inherent –  $V = IR$ ).

10. Regarding Claims 9 and 17, Frietag et al shows (Fig. 10) a head, wherein the head has a thickness of less than about 300A.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Blouin whose telephone number is 571-272-7583.

The examiner can normally be reached on M-F from 6:00 to 3:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen, can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mark Blouin  
Patent Examiner  
Art Unit 2653  
May 23, 2006

A. J. HEINZ  
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